CLAIMS

We claim:

1. A reactor for filtering water comprising:

(a) one or more modules of filtering membranes located within a tank;

(b) a source of transmembrane pressure to the membranes for withdrawing a permeate from the insides of the immersed membranes;

(c) an aeration system operable to supply bubbles to the tank to inhibit fouling of the membranes;

(d) a feed inlet for introducing feed water to the tank;

(e) a retentate outlet for removing retentate from the tank;

(f) a gas recirculation system to collect one or more gases liberated from feed water in the tank and return the collected gases to the aeration system.

2. The reactor of claim 1 wherein the gas recirculation system includes a lid closely fitted to the tank so as to collect gases liberated from substantially the entire surface area of the feed water in the tank but the tank remains open to atmospheric pressure and the transmembrane pressure is provided by applying a suction to the modules.

3. The reactor of claim 1 wherein the lid is substantially sealed to the tank.

4. The reactor of claim 1 wherein the aeration system further comprises a blower and a gas dryer wherein the gas dryer is operable to dry the collected gases before the collected gases are returned to the blower of the aeration system.

5. A process for filtering a feed water comprising the steps of:

(a) providing a tank containing modules of filtering membranes;

(b) introducing feed water to the tank to keep the modules immersed in feed water in the tank;

(c) withdrawing a filtered permeate from the modules;

(d) withdrawing a retentate from the tank;

(e) introducing bubbles into the water in the tank to inhibit fouling of the membranes, the bubbles also causing increased amounts of gases to be liberated from the water in the tank;

(f) collecting gases liberated from the water in the tank and returning the collected gases to the tank by way of the bubbles.

6. The process of claim 5 wherein the collected gases include carbon dioxide.

7. The process of claim 6 wherein 80% or more of the carbon dioxide liberated from the water in the tank is returned to the tank.

8. The process of claim 7 wherein the feed water in the tank has scaling tendencies.

9. The process of claim 7 wherein the feed water has a Langlier Scaling Index of greater than 0.5 before being introduced into the tank.

10. The process of claim 7 further comprising the step of adding coagulants to the feed water in the tank.

11. The reactor of claims 2 or 3 wherein the gas recirculation system includes and inlet and/or an exhaust to the atmosphere to permit the percentage of liberated gases which are collected to be varied.